

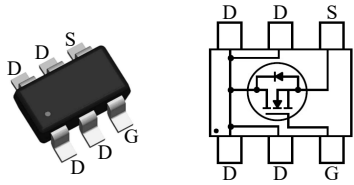


SM6040TDH

N-Channel Enhancement Mode Field Effect Transistor

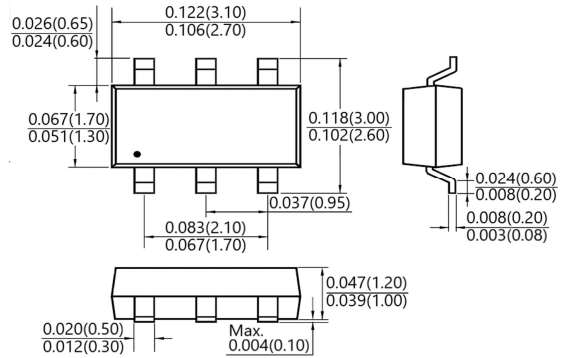
FEATURES

- Low input capacitance
- Low switching speed
- Suffix "H" indicates Halogen-free parts, ex. SM6040TDH



D	Drain
G	Gate
S	Source

SOT-26



Dimensions in inch and (millimeter)

Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	60	V
Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current	I_D	5	A
Pulsed Drain Current (Note 1)	I_{DM}	30	A
Power Dissipation	P_D	1.38	W
Avalanche Current	I_{AS}	10	A
Avalanche Energy (Note 2)	E_{AS}	5	mJ
Thermal Resistance from Junction to Ambient (Note 3)	$R_{\theta JA}$	90	$^\circ\text{C} / \text{W}$
Operating and Storage Temperature Range	T_J, T_{stg}	- 55 to + 150	$^\circ\text{C}$

Note:

1. Pulse width $\leq 100\mu\text{s}$, Duty cycle $\leq 2\%$, Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)} = 150^\circ\text{C}$
2. Limited by $T_{J(max)}$, starting $T_J = 25^\circ\text{C}$, $L = 0.1\text{mH}$, $R_g = 25\Omega$, $I_D = 10\text{A}$, $V_{GS} = 10\text{V}$.
2. Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate in still air.



SM6040TDH

N-Channel Enhancement Mode Field Effect Transistor

Electrical Characteristics ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise specified)

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Static						
Drain Source Breakdown Voltage	$I_D = 250\mu\text{A}$	BV_{DSS}	60	-	-	V
Zero Gate Voltage Drain Current	$V_{DS} = 48\text{V}$	I_{DSS}	-	-	0.1	μA
Gate Source Leakage Current	$V_{GS} = \pm 20\text{V}$	I_{GSS}	-	-	± 0.1	μA
Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 250\mu\text{A}$	$V_{GS(th)}$	1.0	-	3.0	V
Static Drain Source On-Resistance	$V_{GS} = 10\text{V}, I_D = 4.3\text{A}$	$R_{DS(ON)}$	-	-	44	m Ω
	$V_{GS} = 4.5\text{V}, I_D = 4\text{A}$		-	-	60	
Forward Transconductance	$V_{DS} = 10\text{V}, I_D = 4.3\text{A}$	g_{FS}	-	4.7	-	S
Dynamic						
Gate Resistance	$V_{DS} = 0, V_{GS} = 0, f = 1\text{MHz}$	R_g	-	1.9	-	Ω
Total Gate Charge	$V_{DS} = 30\text{V}, I_D = 4.3\text{A}, V_{GS} = 4.5\text{V}$	Q_g	-	6.2	-	nC
			-	13.5	-	
Gate-Source Charge	$V_{DS} = 30\text{V}, I_D = 4.3\text{A}, V_{GS} = 10\text{V}$	Q_{gs}	-	3.5	-	nC
Gate-Drain Charge		Q_{gd}	-	1.5	-	
Input Capacitance	$V_{DS} = 25\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$	C_{iss}	-	877	-	pF
Output Capacitance		C_{oss}	-	52	-	
Reverse Transfer Capacitance		C_{rss}	-	31	-	
Turn on Delay Time	$V_{DD} = 30\text{V}, I_D = 4.3\text{A}, V_{GS} = 10\text{V}, R_g = 6\Omega$	$t_{d(on)}$	-	13.0	-	ns
Turn on Rise Time		t_r	-	14.0	-	
Turn off Delay Time		$t_{d(off)}$	-	11.0	-	
Turn off Fall Time		t_f	-	2.4	-	
Drain-Source Body Diode						
Diode Forward Voltage	$I_S = 1\text{A}$	V_{SD}	-	-	1.2	V
Reverse Recovery Time	$I_S = 4.3\text{A}, di/dt = 100\text{A}/\mu\text{s}$	t_{rr}	-	11	-	ns
Reverse Recovery Charge		Q_{rr}	-	6.8	-	nC



SM6040TDH

N-Channel Enhancement Mode Field Effect Transistor

RATINGS AND CHARACTERISTIC CURVES

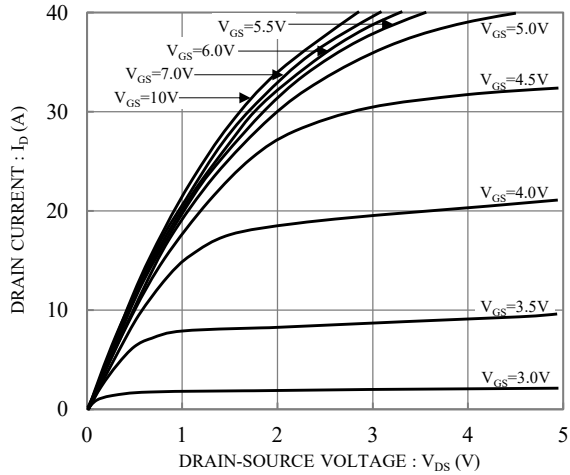


Fig.1 Typical Output Characteristics

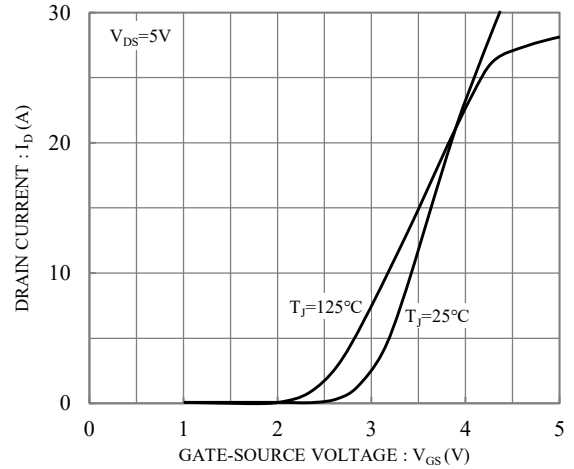


Fig.2 Typical Transfer Characteristics

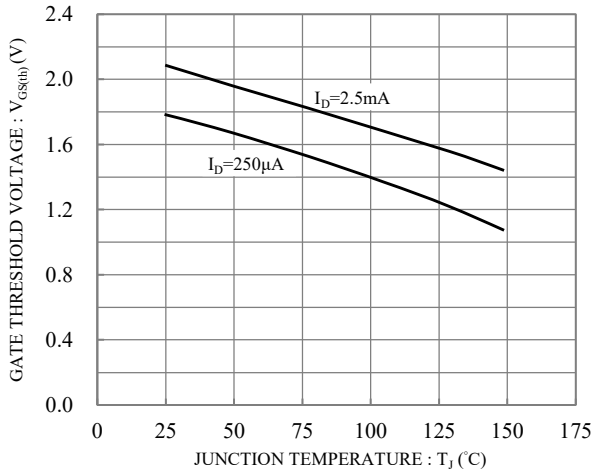


Fig.3 Gate Threshold Voltage vs. Junction Temperature

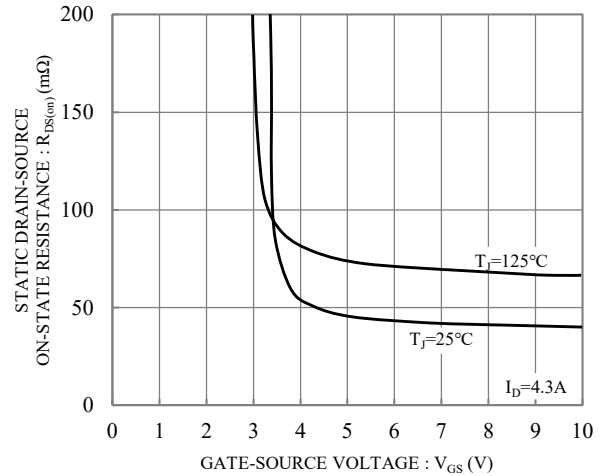


Fig.4 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

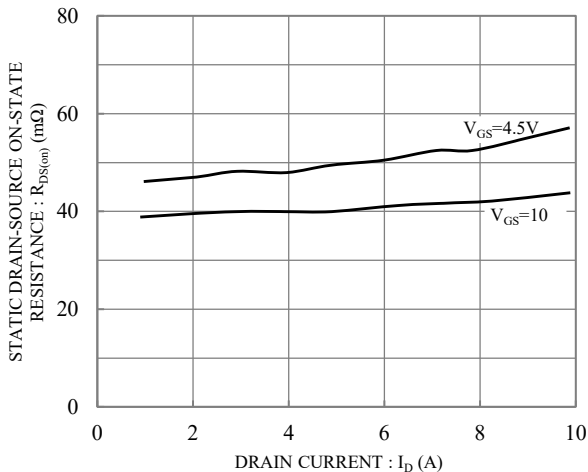


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

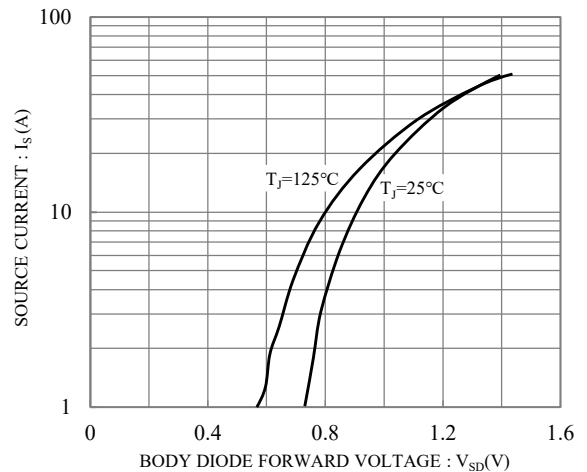


Fig.6 Body Diode Forward Voltage vs. Source Current



SM6040TDH

N-Channel Enhancement Mode Field Effect Transistor

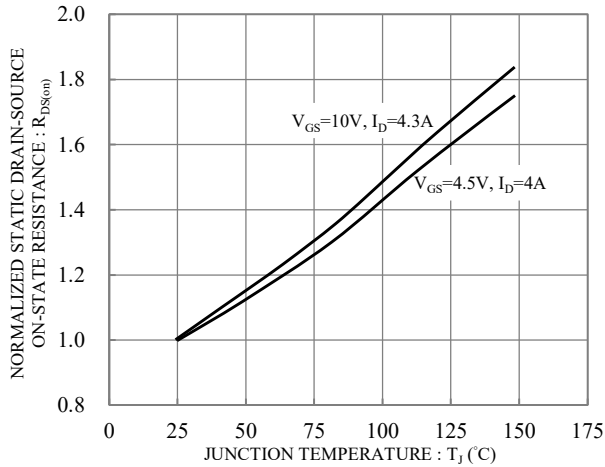


Fig.7 Drain-Source On-State Resistance vs Junction Temperature

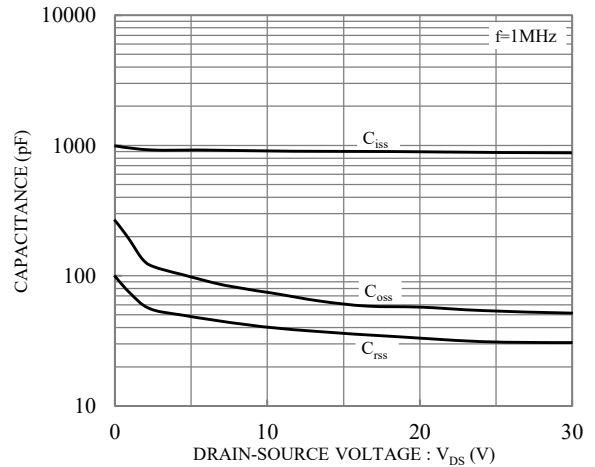


Fig.8 Capacitance vs Drain-Source Voltage

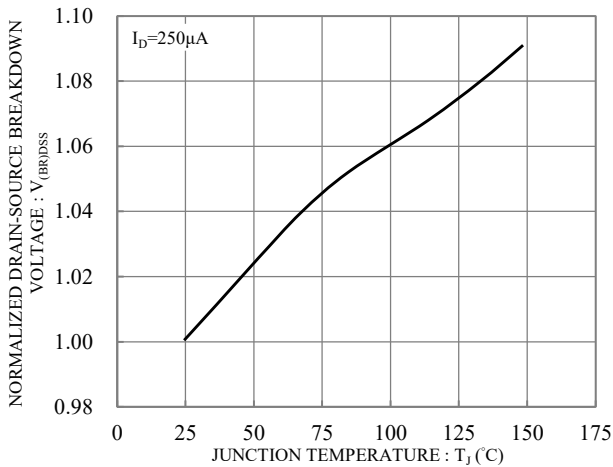


Fig.9 Breakdown Voltage vs Junction Temperature

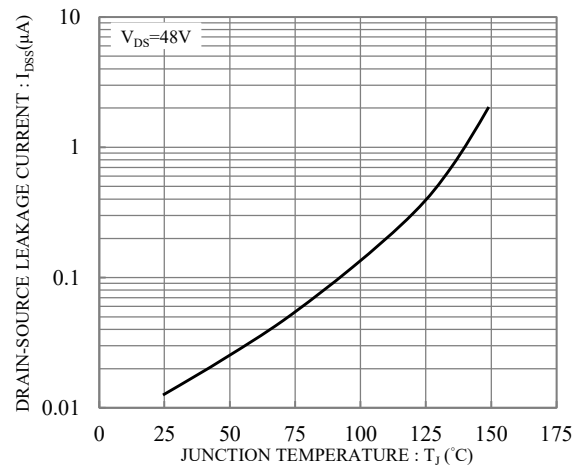


Fig.10 Drain-Source Leakage Current vs Junction Temperature

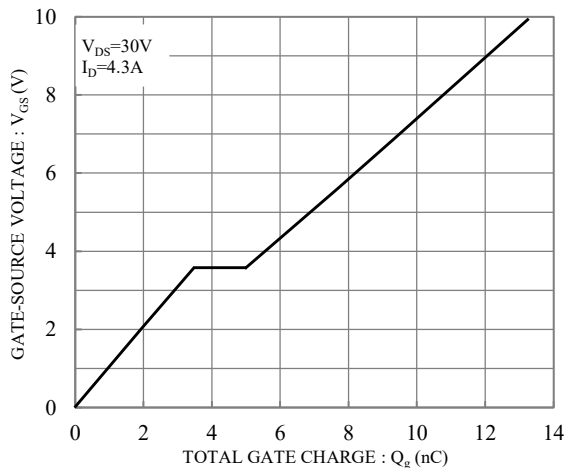


Fig.11 Gate Charge Characteristics

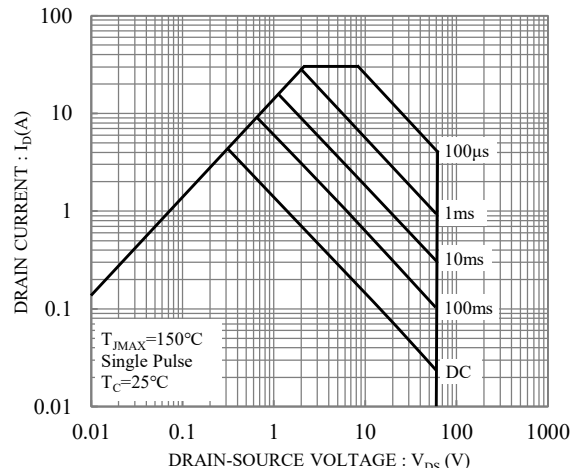


Fig.12 Drain-Source Leakage Current vs Junction Temperature



SM6040TDH

N-Channel Enhancement Mode Field Effect Transistor

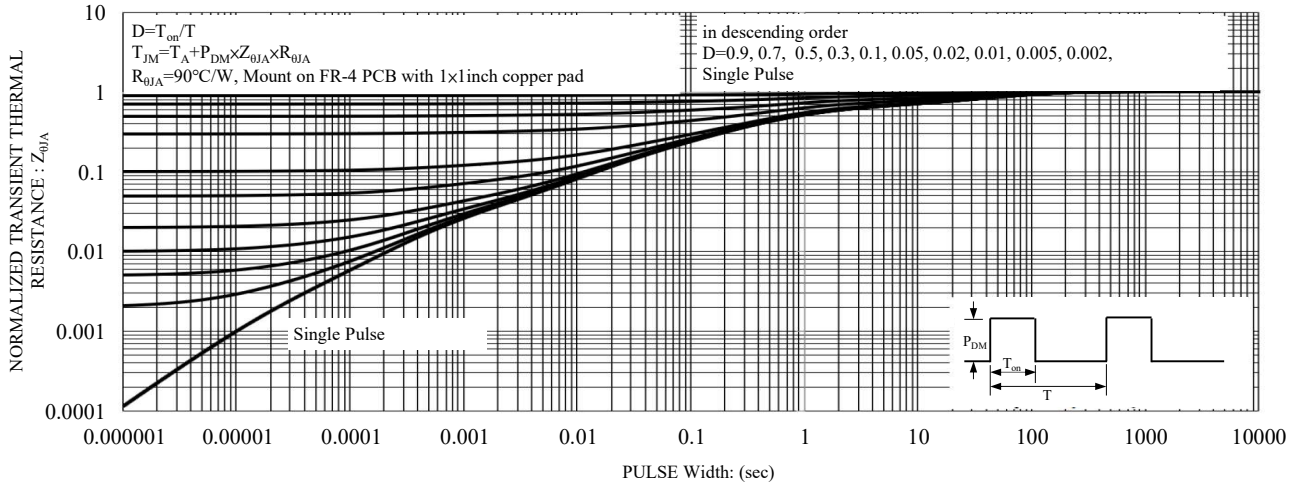


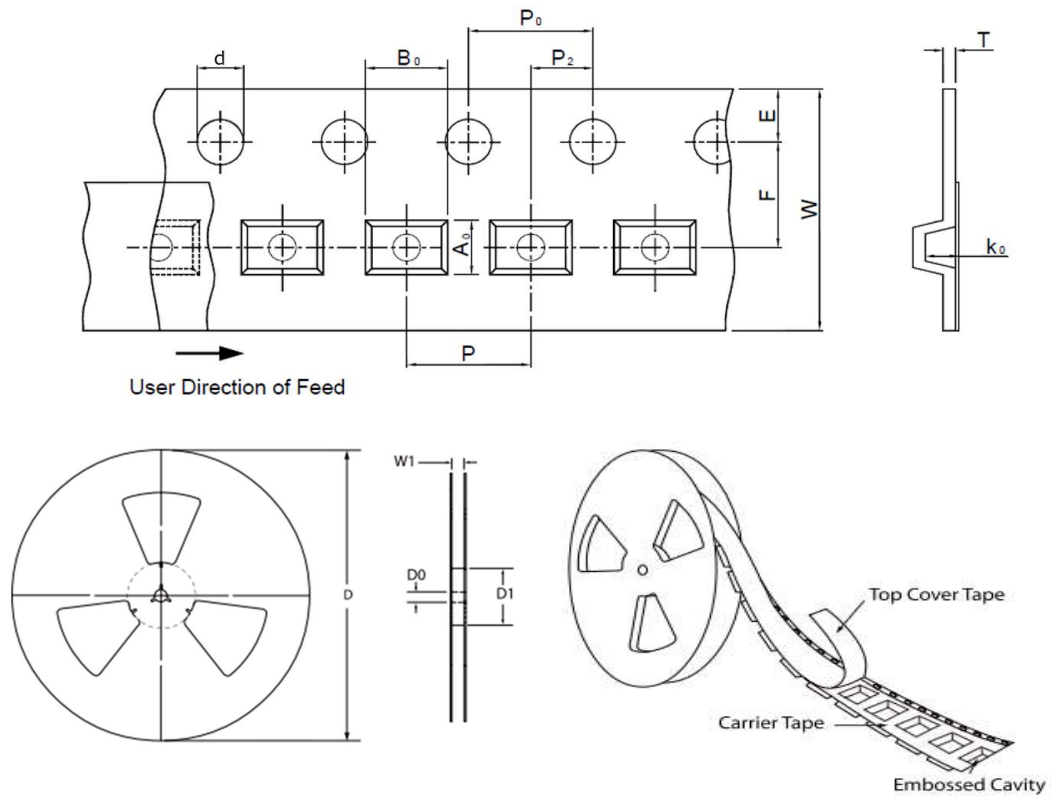
Fig.13 Maximum Transient Thermal Impedance



SM6040TDH

N-Channel Enhancement Mode Field Effect Transistor

TAPE & REEL SPECIFICATION



Item	Symbol	SOT-26
Carrier width	A ₀	3.35 ± 0.10
Carrier length	B ₀	3.35 ± 0.10
Carrier depth	K ₀	1.50 ± 0.10
Sprocket hole	d	1.50 ± 0.10
Reel outside diameter	D	178.00 ± 2.00
Feed hole width	D ₀	13.00 ± 0.50
Reel inner diameter	D ₁	MIN. 50.00
Sprocket hole position	E	1.75 ± 0.10
Punch hole position	F	3.50 ± 0.10
Sprocket hole pitch	P ₀	4.00 ± 0.10
Punch hole pitch	P ₁	4.00 ± 0.10
Embossment center	P ₂	2.00 ± 0.10
Overall tape thickness	T	0.60 ± 0.10
Tape width	W	8.00 ± 0.30
Reel width	W1	MAX. 10.00

ORDER INFORMATION

Package	Reel Size	Quantity
SOT-26	7"	3,000

MARKING CODE

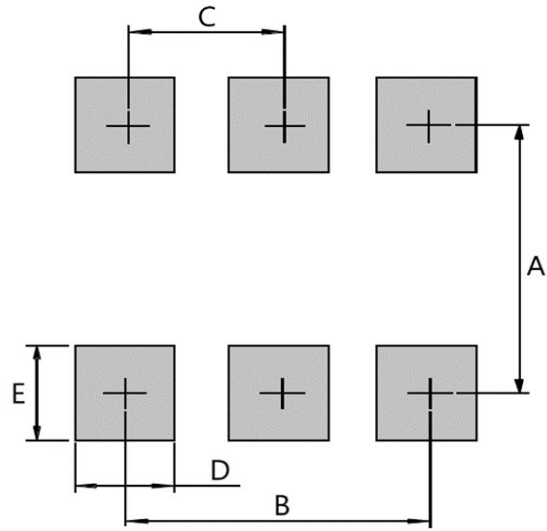
Part Number	Marking Code
SM6040TDH	PB



SM6040TDH

N-Channel Enhancement Mode Field Effect Transistor

SUGGESTED SOLDER PAD LAYOUT



Unit : mm

PACKAGE	A	B	C	D	E
SOT-26	2.40	1.90	0.95	0.70	1.00